

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference FP18527	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).	
International Application No. <b>PCT/AU2003/001300</b>	International Filing Date (day/month/year) 2 October 2003	Priority Date (day/month/year) 2 October 2002
International Patent Classification (IPC) or national classification and IPC <b>Int. Cl. 7 E04C 3/294, E04B 5/32</b>		
Applicant <b>UNIVERSITY OF WESTERN SYDNEY et al</b>		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 5 sheet(s).</p>	
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>	

Date of submission of the demand 30 April 2004	Date of completion of the report 20 January 2005
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  <b>VINCE BAGUSAUSKAS</b> Telephone No. (02) 6283 2110

**I. Basis of the report**

1. With regard to the elements of the international application:\*
- ☐ the international application as originally filed.
- ☒ the description, pages 1-13, as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of
- ☒ the claims, pages 14, 15, as originally filed,  
pages , as amended (together with any statement) under Article 19,  
pages , filed with the demand,  
pages 16, 17, received on 30 December 2004 with the letter of 30 December 2004
- ☒ the drawings, pages 2, as originally filed,  
pages , filed with the demand,  
pages 1, 3, 4, received on 30 December 2004 with the letter of 30 December 2004
- ☐ the sequence listing part of the description:  
pages , as originally filed  
pages , filed with the demand  
pages , received on with the letter of
2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.  
These elements were available or furnished to this Authority in the following language which is:
- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).
3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished
4. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.
5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims 3, 5, 6, 8-12, 16, 17	YES
	Claims 1, 2, 4, 7, 13-15	NO
Inventive step (IS)	Claims 3, 5, 6, 8-12, 16, 17	YES
	Claims 1, 2, 4, 7, 13-15	NO
Industrial applicability (IA)	Claims 1-17	YES
	Claims	NO

**2. Citations and explanations (Rule 70.7)**

The relevant citations from the ISR are:

D1) WO 1996/006994

D2) AU 200169998

**NOVELTY (N) 1, 2, 4, 7, 13 - 15**

*It is considered that the term "embedded" as used in claim 1 does not have a similar meaning to totally within, but may mean that a part of an article is firmly attached to a base; e.g. tiles are embedded in mortar.*

The invention as defined in claims 1, 2, 4, 7, 13 and 14 is disclosed in D1). See the drawings.

The invention as defined in claims 1, 4, 7, 13, 14 and 15 is disclosed in D2). See the drawings.

**INVENTIVE STEP (IS)**

Claims 1, 2, 4, 7, 13 – 15 as above.

The invention as defined in the remaining claims has not been disclosed in the citations individually or in combination that would be obvious to the person skilled in the art.

In the applicants submission of 14 May 2004, it is stated that "...we believe that the Category "X" documents do not disclose the composite beam defined in a number of the *dependant* (my emphasis) claims".

From said statement it is presumed that the applicant disputes that claims 2, 4, 7, 13 to 15 lack novelty and/or an inventive step. However, this argument is not persuasive so as to tip the balance of probabilities in the applicant's favour.

To assist the applicant the following observations are submitted in relation to novelty and inventive step:-

Claim 2, defines that the "line wires" extend in the longitudinal direction. D1) shows wires 47 that extend in the longitudinal direction.

Claim 4, defines a composite slab with a profiled metal sheeting forming an outer surface of the concrete rib. D1) shows this generally at item 11 of Figure 1 and Fig 2, and lines 30 to 32 of page 8 of D2)

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

**Continuation of Box V**

Claim 7, defines that the mesh extends across the width of the concrete rib at the position of the mesh in the concrete rib. D1) shows this at Fig 6. D2) shows this at Fig 2, at the base of the mesh.

Claim 13, defines that the shear connectors are in the form of headed studs. D1) and D2) clearly shows this in figures.

Claim 14, defines that the spacing between the shear connectors *along the length of the beam* is a minimum of 5 times the diameter of the shear connectors. D1) shows this at Fig 1; see the beam 5 and the shear connectors 15. D2) shows this in Fig 4.

Claim 15, defines that spacing of the shear connectors is no more than 7.5 times the height of the shear connectors above the top of the concrete ribs. D2) at Fig 4 that the said height is 15mm.  $7.5 \text{ times } 15\text{mm} = 112.5\text{mm}$ . The measured distance between the shear connectors from Fig 4 of D2) is 95mm.

11. The composite beam defined in claim 10 wherein the additional reinforcing elements is cranked handlebar-shaped.

12. The composite beam defined in claim 10 or claim 11 wherein the section or sections of each additional reinforcing element that is out of the plane of the mesh extends from the concrete rib into the slab section of the solid slab on the composite slab.

13. The composite beam defined in any one of the preceding claims wherein there are a plurality of shear connectors in the form of headed studs.

14. The composite beam defined in any one of the preceding claims wherein there is a plurality of shear connectors and a minimum spacing between the shear connectors along the length of the beam of at least 5 times the diameter of the shear connectors.

15. The composite beam defined in any one of the preceding claims wherein there is a plurality of shear connectors and the spacing between the shear connectors along the length of the beam is no more than 7.5 times the height of the shear connectors above the top of the concrete ribs.

16. A composite beam substantially as hereinbefore described with reference to the accompanying drawings.

17. A composite beam which includes:

(a) a beam;

(b) a solid slab or a composite slab positioned on and supported by the beam, the solid slab

- 17 -

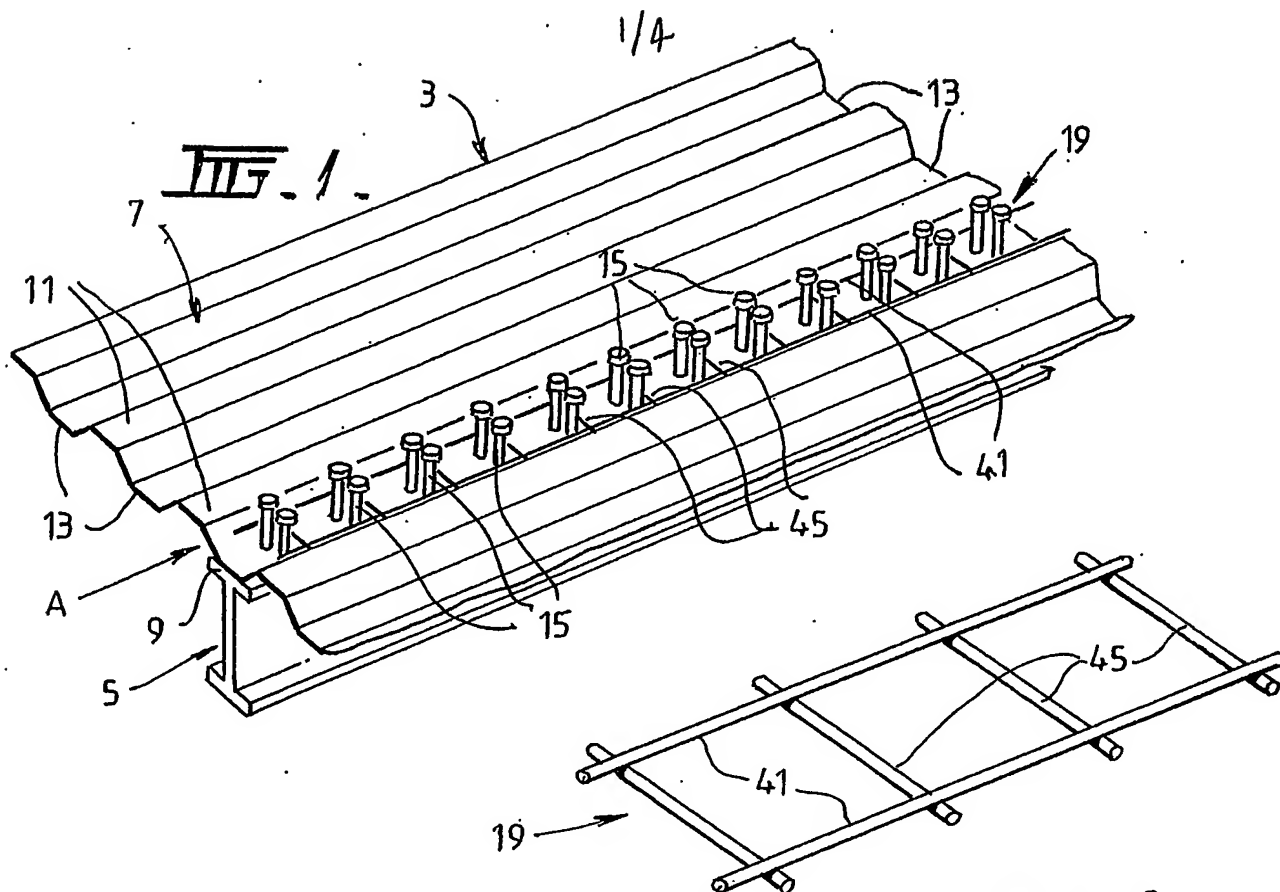
and the composite slab including a slab section and a plurality of concrete ribs extending from the slab section;

- 5 (c) at least one shear connector positioned in at least one of the concrete ribs and connecting the solid slab or the composite slab to the beam; and
- 10 (d) a reinforcing component embedded in at least one concrete rib that includes a said embedded shear connector or connectors, the reinforcing component being in the form of a mesh that includes line wires and cross
- 15 wires that are connected together at the intersections of the wires, the mesh being positioned so that the line wires extend in the longitudinal direction of the concrete rib, ie in the longitudinal direction of the beam, and the mesh being positioned in the
- 20 concrete rib between 25% and 75% of the height of the concrete rib.

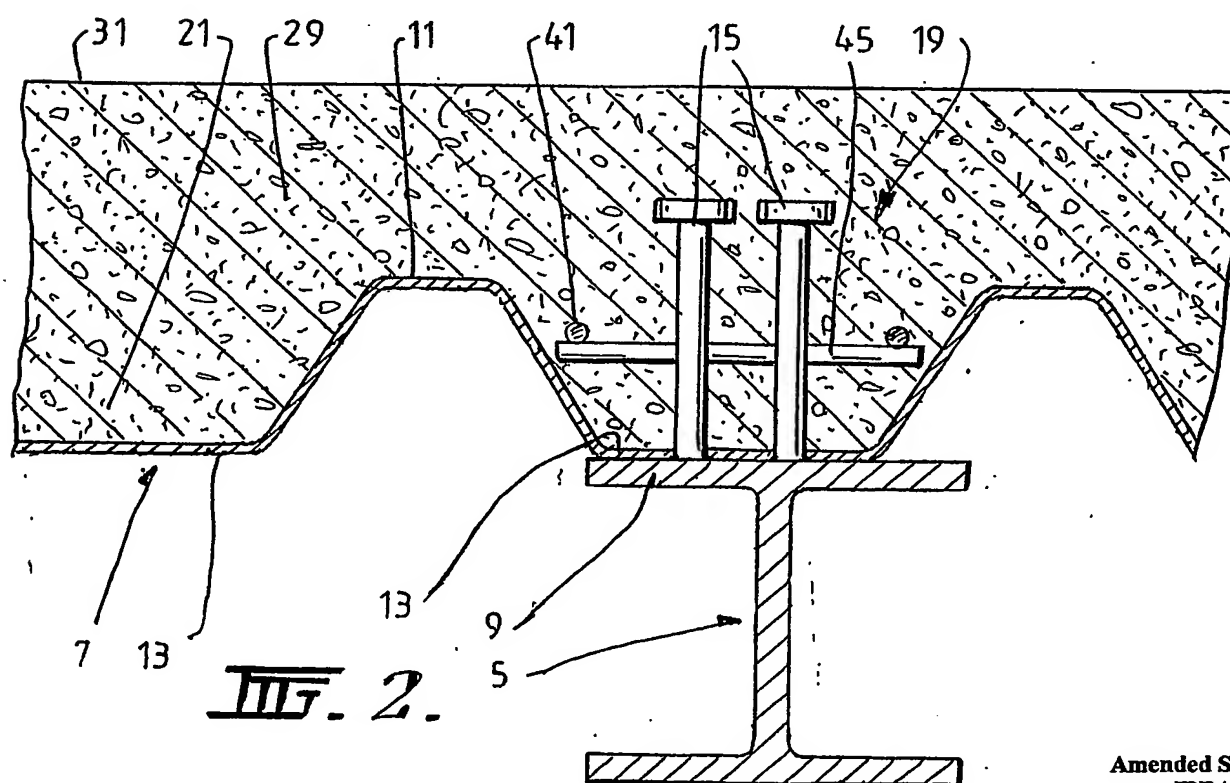
- 18 -

**ABSTRACT**

A composite beam is disclosed. The beam includes a beam  
(5), a solid slab or a composite slab (29) positioned on  
5 and supported by the beam, the solid slab and the composite  
slab including a slab section and a plurality of concrete  
ribs (21) extending from the slab section. The beam also  
includes at least one shear connector (15) positioned in at  
least one of the concrete ribs and connecting the solid  
10 slab or the composite slab to the beam. The beam also  
includes a reinforcing component (19) embedded in at least  
one concrete rib that includes an embedded shear connector  
or connectors. The reinforcing component is in the form of  
a mesh that includes line wires (41) and cross wires (43)  
15 that are connected together at the intersections of the  
wires.



III. 3.

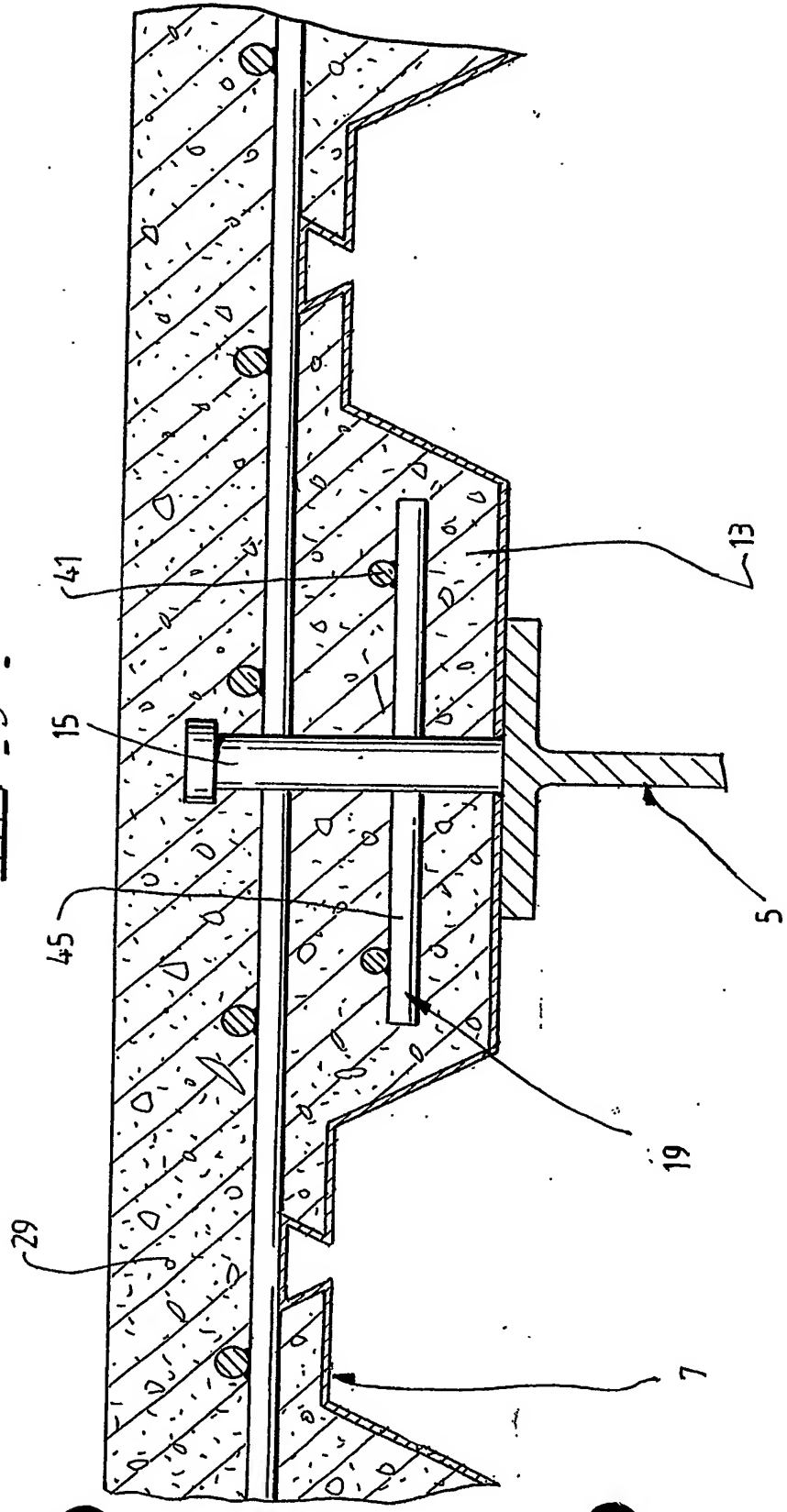


### III. 2.



3/4

Fig. 5



4/4

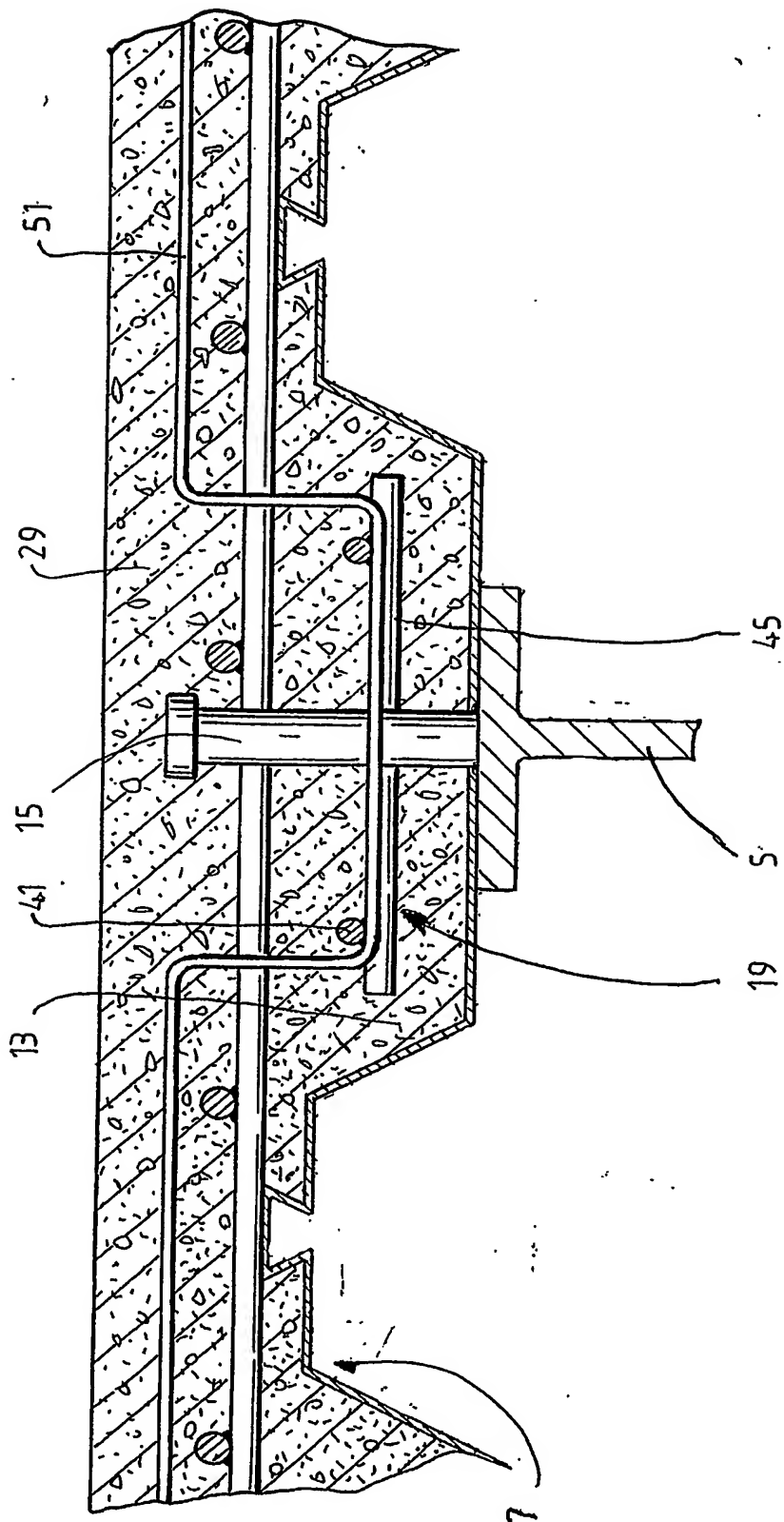


Fig. 6.